FAA-E-2470b
December 5, 1985
SUPERSEDING
FAA-E-2470a, 4/30/76

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
SPECIFICATION

TRANSPARENT PLASTIC WINDOW SHADES

1. SCOPE

1.1 Scope - This specification sets forth the requirements for material, fabrication, and installation of transparent plastic window shades for use in Airport Traffic Control Tower (ATCT) cabs. These shades are required to reduce the sun's direct and reflective glare and to contribute to temperature control of tower cabs. Shades shall be installed on all exposures of the cab.

2. APPLICABLE DOCUMENTS

2.1 Federal Publications - The following Federal publications, of the issues in effect on the date of the invitation for bids or request for proposals, form a part of this specification and are applicable to the extent specified herein. In the event of a conflict between requirements of this equipment specification and documents listed or referenced herein, this specification shall have precedence.

2.1.1 Federal Specification - L-P-377b - Plastic Sheet and Strip Polyester (Copies of this specification may be obtained from the Contracting Officer in the Federal Aviation Administration office issuing the invitation for bids or request for proposals. Requests should cite the invitation for bids, request for proposals, or the contract involved or other use to be made of the requested material.)

2.1.2 Federal Standard - FED-STD-102 - Preservation, Packaging and Packing Levels (Information on obtaining copies of Federal specifications and standards may be obtained from General Services Administration offices in Washington, D.C.; Seattle; San Francisco; Denver; Kansas City, MO; Chicago; Atlanta; New York City; Boston; Dallas; and Los Angeles.)

2.2 Other Publications - The following publication, of the issue in effect on the date of the invitation for bids or request for proposals, forms a part of this specification and is applicable to the extent specified herein.

2.2.1 AIMCAL Standard Methods
(Copies of the Association of Industrial Metalizers, Coaters and Laminators (AIMCAL) Standard Methods may be obtained from AIMCAL, 61 Blue Ridge Road, Wilton, CT 06897 (203-762-5611).

3. REQUIREMENTS

3.1 Materials to be Furnished - Material furnished by the contractor shall be complete in accordance with all specification requirements and shall include the following items.

3.1.1 Transparent Plastic Shade Material - Shade film shall be manufactured from a polyester type polymer in accordance with Federal Specification L-P-377b dated February 28, 1966 for Type V (DuPont's "Mylar" clear sheet film or approved equal).

3.1.2 Transparent Plastic Shade Film Construction - The transparent plastic shade film construction shall be in accordance with Madico, Inc. of Woburn, Massachusetts Type SSLW-500-SR/Gray/SR or approved equal. Shade product shall consist of four-ply laminated polyester film. The two laminated center sheets shall each be 1.5 mil thick polyester vat dyed gray in color meeting the Martin Processing Co. of Martinville, VA specification (Gray dye, reference #8301 and laminate reference #51012) or approved equal. A clear 1 mil thick polyester film shall be laminated to each side of the gray dyed film laminate. Both exposed sides of the shade film surfaces shall be protected with a scratch resistant coating. The final film construction will be 5 mils thick, optically clear and totally transparent. Surface tinting and/or colored adhesives will not be an acceptable equal without independent reports qualifying the color stability in comparison with the vat dyed process.

3.1.3 Shade Solar Optical Properties

3.1.3.1 Visible Light Transmission - The shade shall transmit no more than 6% of the visible solar energy (from 380 to 780 nanometers) when measured by the Association of Industrial Metalizers, Coaters and Laminators (AIMCAL) standard methods.

3.1.3.2 Ultra-Violet Transmission - The shade shall transmit no more than 4% of the ultra-violet solar energy (from 300 to 380 nanometers) when measured by AIMCAL standard methods.

3.1.3.3 Total Solar Energy Rejected - The shade shall reject 48% of the total solar energy transmitted from 360 to 2100 nanometers when measured by AIMCAL standard methods.

3.1.4 Bottom Bar - Shades shall have a flat one-inch by one-half-inch, dull black, full width metal hemline bar, (minimum of 26 gauge) at bottom onto which the pull cord and shade are attached. Black plastic caps shall be provided on each end of hemline bar to cover any sharp exposed edges.

3.1.5 Shade Cords - Shall be color black and of sufficient length to route around stairwell and equipment to cord lock positions whenever required. The cords shall be 9/64" diameter rope made of 4.5 Duro Nylon or approved equal and shall be attached underneath the center of the bottom of the hemline bar.

3.1.6 Shade Rollers - Shades shall be mounted on 1 3/4" diameter metal wrapped rollers. The rollers shall be spring loaded, single piece barrel, with a reusable safety cotter key type retainer installed through both end pins and washers to prevent roller from falling out of mounting brackets. Constant tension in shades is required. Mounting brackets shall be Plastic View, Van Nuys, CA, PV 128-205A and B, or approved equal with a 2¼ inch resting ledge. Regular "industry norm" ceiling brackets are not acceptable. A label stating "THIS END DOWN" with an arrow pointing to the proper installation direction of the roller into the mounting brackets shall be placed on the spring motor end of each shade roller. The shade film laminate material shall be mounted on rollers so as to minimize ridgings. Roll-off direction of material from roller shall be as directed by the shade manufacturer for use in the specific tower cab under consideration. Each shade shall have a label or whatever suitable means required to specify and identify the proper roll-off direction.

3.1.7 Shade Labels - Each shade shall have a manufacturer's label attached to the metal bar hemline giving cleaning instructions and the telephone number for emergency service.

3.1.8 Lock Pulley and Cord Direction Change Pulley - Lock pulleys shall consist of a roller and a spring return side action cam cord grip #R359 Britain, Merriman, Co. Millersville, MD or approved equal. Cord direction change pulleys #PV-128-CDC/57-1006/8 Plastic View, Van Nuys, CA or approved equal shall be used to route shade cord around obstructions where they exist. Pulleys shall be positioned in direct line with cord outlet on metal hemline.

3.2 Fabrication

3.2.1 Shade Size - Shade roller width shall be to within ½ inch of maximum possible width as determined by physical limitations. Shade material width with shade fully drawn shall be to within 1 inch of columns on bias cut sides and to within 1 3/4 inch of columns on vertical cut sides. Horizontal seam shall be located a minimum of 55 inches from the bottom of the shade. S' ades in ATCT cabs shall be bias cut when required. To insure a safe roll-up, a minimum of 15" of shade material shall remain on the roller when the shade is fully extended.

3.3 Measuring for Shades - Measuring for shades and positioning shall be strictly in accordance with the shade manufacturer's instructions. Marks showing the precise position of all brackets, pulleys, and metal hemline positions as related to the factory measuring instructions shall be provided. All measurements shall be taken per instructions from shade manufacturer.

3.4 Installation - Shades shall be installed in shade recess pockets or on wood or metal plates. Shades shall follow the slope of cab glass as closely as practical within physical limitations of air ducts and other equipment. No drilling is to be done in vertical uprights of cab, as some uprights contain electrical cables. Spring tension in roller shall be manually adjusted so that shades roll up comfortably. In order to safely control and limit the shade travel, the installer shall make two knots in the shade cord. One knot is to be placed before the lock pulley to prevent the metal hemline bar from hitting the window sill. The second knot is to be placed after the lock pulley to prevent the metal hemline bar from hitting and overrunning the shade roller. Adherence to the "THIS END DOWN" label when installing shade will prevent improper roller installation which can result in a locked shade situation when the metal bar hemline is near the lock pulley and cannot be pulled down to release the spring motor cam lock.

4. QUALITY ASSURANCE PROVISIONS

4.1 Shop Drawings - The contractor shall submit shop drawings based on actual site conditions, material lists, an 8" x 10" or larger sample of shade material, and a hand sample model of the roller and hardware for inspection prior to the fabrication of shades.

4.2 Warranty - The contractor shall furnish the Government with three (3) certified copies of the product warranty that certifies that all the specification requirements have been met.

5. PREPARATION FOR DELIVERY

5.1 Packaging. - Packaging shall be in accordance with FED-STD-102, Level "B". Shades shall be packaged to afford adequate protection against deterioration and damage during shipment. The supplier may use his standard practice when it meets these requirements.

6. NOTES

6.1.1 Smaller Rollers - The requirement for a 1 3/4" diameter roller (section 3.1.6) shall not apply for shades being installed in portable type airport traffic control towers or in installations where physical constraints restrict the proper operation of the shade; however, the roller diameter shall be as large as possible to allow the shade material to negotiate the roller radius without damage.

6.1.2 - Notification on Concurrence - The Contracting Officer in the Federal Aviation Administration office issuing the invitation for bids shall be notified if the 1 3/4" diameter roller cannot be used. Concurrence from the Contracting Officer shall be required prior to contract award.